IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Mohamed K. Diab, et al.	) Group Art Unit Unknown
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Appl. No.	:	Unknown	)
			)
Filed	:	Herewith	)
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For	:	SIGNAL PROCESSING APPARATUS	)
			)
Examiner	:	Unknown	)
			)

REQUEST FOR INTERFERENCE
37 C.F.R. §1.607

Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

Applicants seek to have an interference declared between this application and an unexpired patent. Pursuant to 37 C.F.R. §1.607, applicant submits the following information.

1. <u>Identification of the Patent -- 37 C.F.R. §1.607(a)(1)</u>

The patent is U.S. Patent No. 5,662,105 (the '105 patent) issued on Sep. 2, 1997 to Jonathan Tien, entitled SYSTEM AND METHOD FOR THE EXTRACTMENT OF PHYSIOLOGICAL SIGNALS, and assigned to SpaceLabs Medical, Inc. of Redmond, WA.

2. <u>Presentation of the Proposed Counts -- 37 C.F.R. §1.607(a)(2)</u>

<u>Count 1</u>:

A system for the enhancement of physiological signals for the measurement of blood oxygen in a subject, the system comprising:

first and second light sources to direct light toward the subject, said first and second light sources producing first and second light signals of first and second wavelengths, respectively;

a light detector positioned to detect said first and second light signals after interaction with the subject and to generate first and second signals indicative of an intensity of said first and second detected light signals, respectively, said first generated signal having a first portion arising from light transmitted from said first source and a second portion arising from a first interference source; said second generated signal having a first portion arising from light transmitted from said second source and a second portion arising from a second interference source;

an adaptive signal processor having a signal input coupled to said light detector to receive said first generated signal, an adaptive filter having an input to receive a reference signal, and an output, and an error output to generate an error signal, wherein said error output is coupled to said adaptive filter to adjust said adaptive filter so that a function of said error signal has a minimum;

wherein said first and second portions of said first and second generated signals and a first ratio constant have a defined mathematical relationship;

a reference signal generator to generate said reference signal based on a possible value of said first ratio constant; and

a peak detector to receive an output signal from said adaptive signal processor and determine a calculated value for said first ratio constant corresponding to a first peak value of said output signal over a predetermined range of possible ratios, said reference signal generator generating said first portion of said first detected signal and said first portion of said second detected signal based on said mathematical relationship and said calculated value of said first ratio constant.

Count 2:

A system for the enhancement of physiological signals for the measurement of blood oxygen in a subject, the system comprising:

first and second light sources to direct light toward the subject, said first and second light sources producing first and second light signals of first and second wavelengths, respectively;

a light detector positioned to detect said first and second light signals after interaction with the subject and to generate first and second signals indicative of an intensity of said first and second detected light signals, respectively, said first generated signal having a first portion arising from light transmitted from said first source and a second portion arising from a first interference source; said second generated signal having a first portion arising from light transmitted from said second source and a second portion arising from a second interference source;

an adaptive signal processor having a signal input coupled to said light detector to receive said first generated signal, an adaptive filter having an input to receive a reference signal, and an output, and an error output to generate an error signal, wherein said error output is coupled to said adaptive filter to adjust said adaptive filter so that a function of said error signal has a minimum;

wherein said first and second portions of said first and second generated signals and a first ratio constant have a mathematical relationship derived from the following model:

$$S_{red} = s_1 + n_1$$
$$S_{IR} = s_2 + n_2$$
$$s_1 = r_a\, s_2$$
$$n_1 = r_v\, n_2$$

where S_{red} corresponds to said first generated signal, s_1 corresponds to said first portion of said first generated signal, n_1 corresponds to said second portion of said first generated signal, S_{IR} corresponds to said second generated signal, s_2 corresponds to said first portion of said second generated signal, n_2 corresponds to said second portion of said second generated signal, r_a is said first ratio constant and corresponds to a ratio of said first portion of said first generated signal to said first portion of said second generated signal, and r_v is a second ratio constant and corresponds to a ratio of said second portion of said first generated signal to said second portion of said second generated signal;

a reference signal generator to generate said reference signal based on a possible value of said first ratio constant; and

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a peak detector to receive an output signal from said adaptive signal processor and determine a calculated value for said first ratio constant corresponding to a first peak value of said output signal over a predetermined range of possible ratios, said reference signal generator generating said first portion of said first detected signal and said first portion of said second detected signal based on said mathematical relationship and said calculated value of said first ratio constant.

An extra copy of the proposed counts is submitted herewith for the Examiner's use in filling out PTO forms.

3.   Identification of At Least One Claim in the Patent-- 37 C.F.R. §1.607(a)(3)

Claims 1-7, 10-14, 17 and 18 of the '105 patent correspond to Count 1.

Claims 8, 9, 15, 16, 19 and 20 of the '105 patent correspond to Count 2.

4.   Presentation of At Least One Claim Corresponding To The Proposed Count And an Explanation Of How the Identified Claims Correspond to the Proposed Count-- 37 C.F.R. §1.607(a)(4)

Claims 15-19, 22-25, 27 and 28 of the application correspond to Count 1.

Claims 20, 21, 26, 29 and 30 of the application correspond to Count 2.

While Claims 16-30 of the application and Claims 1-20 of the '105 patent do not correspond exactly to the proposed counts, Applicants do not currently argue that any of those claims is drawn to a separate patentable invention from the count to which they correspond within the meaning of 37 C.F.R. §1.601(n).

5.   Application of the Presented Claims to the Disclosure-- 37 C.F.R. §1.607(a)(5)

The terms of the application claims identified as corresponding to the proposed count and not previously in the application can be applied to the disclosure of the application as follows:

TERMS OF THE CLAIMS	APPLICATION TO THE DISCLOSURE
15. A system for the enhancement of physiological signals for the measurement of blood oxygen in a subject,	p. 6, ll. 4-9; p. 6, l. 25 - p. 7, l. 13; p. 63, l. 33 - p. 64, l. 12.
the system comprising:	

TERMS OF THE CLAIMS	APPLICATION TO THE DISCLOSURE
first and second light sources to direct light toward the subject, said first and second light sources producing first and second light signals of first and second wavelengths, respectively;	p. 8, ll. 1-4; p. 64, l. 28 - p. 65, l. 1; p. 65, ll. 18-24; p. 67, ll. 25-27.
a light detector positioned to detect said first and second light signals after interaction with the subject and to generate first and second signals indicative of an intensity of said first and second detected light signals, respectively, said first generated signal having a first portion arising from light transmitted from said first source and a second portion arising from a first interference source, said second generated signal having a first portion arising from light transmitted from said second source and a second portion arising from a second interference source;	p. 7, ll. 13-36; p. 8, l. 1-14; p. 18, ll. 8-29; Figures 4a-4b; p. 64, ll. 28-33; p. 65, ll.20-28; p. 67, ll. 25-36; p. 114, ll. 3-16; Figures 26, 27.
an adaptive signal processor having a signal input coupled to said light detector to receive said first generated signal, an adaptive filter having an input to receive a reference signal, and an output, and an error output to generate an error signal, wherein said error output is coupled to said adaptive filter to adjust said adaptive filter so that a function of said error signal has a minimum;	p. 17, ll. 10-21; p. 18, ll. 6-10 Figures 4a - b p. 19, l. 19 - p. 21, l. 15; Figures 5a - b p. 37, l. 4 - p. 38, l. 24; p. 65, ll. 27-32; Figure 11.
wherein said first and second portions of said first and second generated signals and a first ratio constant have a defined mathematical relationship;	p. 16, l. 25 - p. 17, l. 8; p. 18, l. 8 - p. 19, l. 9; Figures 4a, 4b; p. 23, ll. 9 - 29 and, in particular, Equations 5a, 5b; p. 120, ll. 23-30.
a reference signal generator to generate said reference signal based on a possible value of said first ratio constant; and	p. 18, l. 30 - p. 19, l. 14; Figures 4a, 4b; p. 36, l. 29 - p. 37, l. 31; p. 120, ll. 23-30.
a peak detector to receive an output signal from said adaptive signal processor and determine a calculated value for said first ratio constant corresponding to a first peak value of said output signal over a predetermined range of possible ratios, said reference signal generator generating said first portion of said first detected signal and said first portion of said second detected signal based on said mathematical relationship and said calculated value of said	p. 22, l. 24 - p. 23, l. 29, and in particular Equation 5b; p. 37, l. 32 - p. 38, l. 24; Figures 7a-c; p. 80, l. 36- p. 81, l. 26; Figure 18.

TERMS OF THE CLAIMS	APPLICATION TO THE DISCLOSURE
first ratio constant.	
16. The system of Claim 15 wherein said output signal received by said peak detector is selected from a set of output signals comprising approximations to said first and second signal portions of said first and second signals, wherein said error output and said adaptive filter output generate output signals of said set.	p. 20, l. 29 - p. 21, l. 15; Figure 5a-b;
17. The system of Claim 15, further including an oxygen saturation calculating circuit to determine blood oxygen saturation of the subject based on said calculated value of said first ratio constant.	p. 86, l. 6 - p. 89, l. 16; Figure 19. p. 79, ll. 12-15; Figure 17; p. 81, ll. 19-26; Figure 18; p. 86, l. 6 - p. 89, l. 16; Figure 19.
18. The system of Claim 15, further including a data table interrelating said calculated value of said first ratio constant with blood oxygen saturation level.	p. 86, l. 6 - p. 89, l. 16; Figure 19. p. 79, ll. 12-15; Figure 17; p. 81, ll. 19-26; Figure 18; p. 86, l. 6 - p. 89, l. 16; Figure 19.
19. The system of Claim 15 wherein said first and second wavelengths are in the red and infrared wavelength range, respectively.	p. 22, ll. 3-15; p. 42, l. 17; p. 65, ll. 20-24; p. 79, ll. 8-12; p. 116, ll. 10-13.
20. The system of Claim 15 wherein said mathematical relationship has the following form: $s_2 = (S_{red} - r_v S_{IR})/(r_a - r_v)$ and $s_1 = r_a s_2$ where s_1 corresponds to said first portion of said first	p. 15, ll. 29 - 36; p. 16, l. 25 - p. 17, l. 6; p. 98, l. 22 - p. 99, l. 2; p. 99, l. 24 - p. 100, ll. 1-4.

TERMS OF THE CLAIMS	APPLICATION TO THE DISCLOSURE
generated signal, S_{red} corresponds to said first generated signal, including said first and second portions of said first generated signal, S_{IR} corresponds to said second generated signal, including said first and second portions of said second generated signal, r_a is said first ratio constant and corresponds to a ratio of said first portion of said first generated signal to said first portion of said second generated signal, and r_v is a second ratio constant and corresponds to a ratio of said second portion of said first generated signal to said second portion of said second generated signal.	
21. The system of Claim 15 wherein said mathematical relationship has the following form: $s_2 = (S_{red} - r_v S_{IR})/(r_a - r_v)$ where s_2 corresponds to said first portion of said second generated signal, S_{red} corresponds to said first generated signal, including said first and second portions of said first generated signal, S_{IR} corresponds to said second generated signal, including said first and second portions of said second generated signal, r_a is said first ratio constant and corresponds to a ratio of said first portion of said first generated signal to said first portion of said second generated signal, and r_v is a second ratio constant and corresponds to a ratio of said second portion of said first generated signal to said second portion of said second generated signal.	p. 15, ll. 29 - 36; p. 16, l. 25 - p. 17, l. 6; p. 98, l. 22- p. 99, l. 2; p. 99, l. 24 - p. 100, ll. 1-4.
22. A method for the enhancement of physiological signals for the measurement of blood oxygen in a subject,	p. 6, ll. 4-9; p. 6, l. 25 - p. 7, l. 13; p. 63, l. 33 - p. 64, l. 12.
the method comprising the steps of:	
directing light from first and second light sources of different wavelengths toward the subject;	p. 8, ll. 1-4; p. 64, l. 28 - p. 65, l. 1; p. 65, ll. 18-24; p. 67, ll. 25-27.

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TERMS OF THE CLAIMS	APPLICATION TO THE DISCLOSURE
detecting signals from said first and second light sources after interaction with the subject and generating first and second signals corresponding to an intensity of said first and second detected signals, respectively, said first generated signal having a first portion arising from light transmitted from said first source and a second portion arising from a first interference source, said second generated signal having a first portion arising from light transmitted from said second source and a second portion arising from a second interference source;	p. 7, ll. 13-36; p. 8, l. 1-14; p. 18, ll. 8-29; Figures 4a-4b; p. 64, ll. 28-33; p. 65, ll.20-28; p. 67, ll. 25-36; p. 114, ll. 3-16; Figures 26, 27.
coupling said first generated signal to a signal input of an adaptive signal processor having an adaptive filter having an input to receive a reference signal, and an output, and an error output generating an error signal wherein said error signal is coupled to said adaptive filter to adjust said adaptive filter so that a function of said error signal has a minimum;	p. 17, ll. 10-21; p. 18, ll. 6-10 Figures 4a – b p. 19, l. 19 – p. 21, l. 15; Figures 5a – b p. 37, l. 4 - p. 38, l. 24; p. 65, ll. 27-32; Figure 11.
coupling an output signal from said adaptive signal processor to a peak detector and calculating a first ratio value corresponding to a first detected peak value of said error signal over a predetermined range of possible ratio values;	p. 36, l. 29-p. 37, l. 31 p. 37, l. 32- p. 38, l. 24 Figures 7a-c; p. 80, l. 36- p. 81, l. 26; Figure 18.
generating a first reference signal based on a mathematical relationship of said first and second portions of said first and second generated signals, and said first ratio value; and	p. 16, l. 25 - p. 17, l. 8; p. 18, l. 8 - p. 19, l. 14; Figures 4a, 4b; p. 23, ll. 9 - 29 and, in particular, Equations 5a, 5b; p. 120, ll. 23-30.
coupling said first reference signal to said adaptive filter input wherein said filter output generates an estimate	p. 20, l. 29 - p. 21, l. 15; Figure 5b;

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TERMS OF THE CLAIMS	APPLICATION TO THE DISCLOSURE
of said first portion of said first generated signal.	p. 22, l. 24 - p. 23, l. 29;
23. The method of Claim 22 wherein said output signal from said adaptive signal processor is said error signal and said calculated first ratio value is based on said first detected peak value in said error signal.	p. 20, l. 29 - p. 21, l. 15; Figures 5a-b; p. 37, l. 32- p. 38, l. 24 Figures 7a-c; p. 80, l. 36- p. 81, l. 26; Figure 18.
24. The method of Claim 22 wherein said output signal from said adaptive signal processor is derived from said adaptive filter output and said calculated first ratio value is based on said first detected peak value in said output signal derived from said adaptive filter output.	p. 20, l. 29 - p. 21, l. 15; Figures 5a-b; p. 37, l. 32- p. 38, l. 24 Figures 7a-c; p. 80, l. 36- p. 81, l. 26; Figure 18.
25. The method of Claim 24, further including the step of generating an approximation to said first portion of said second generated signal based on said mathematical relationship and said calculated first ratio value.	p. 21, ll. 2-8; Figure 5a p. 22, l. 3 - p. 23, l. 18.
26. The method of Claim 25 wherein said first ratio value is a ratio of said first portion of said first generated signal to said first portion of said second generated signal.	p. 22, l. 3 - p. 23, l. 29, and in particular Equation 3; p. 120, ll. 23-30.
27. The method of Claim 22, further including the step of determining a blood oxygen saturation level of the subject based on said calculated first ratio value.	p. 79, ll. 12-15; Figure 17; p. 81, ll. 19-26; Figure 18; p. 86, l. 6 - p. 89, l. 16; Figure 19.
28. The method of Claim 22, further including the step of determining a blood oxygen saturation level of the subject using a data table interrelating said calculated first ratio value with blood oxygen saturation level.	p. 86, l. 6 - p. 89, l. 16; Figure 19; p. 79, ll. 12-15; Figure 17;

TERMS OF THE CLAIMS	APPLICATION TO THE DISCLOSURE
	p. 81, ll. 19-26; Figure 18.
29. The method of Claim 22 wherein said mathematical relationship has the following form: $$s_2 = (S_{red} - r_v S_{IR})/(r_a - r_v) \text{ and } s_1 = r_a s_2$$ where s_1 corresponds to said first portion of said first generated signal, S_{red} corresponds to said first generated signal, including said first and second portions of said first generated signal, S_{IR} corresponds to said second generated signal, including said first and second portions of said second generated signal, r_a is said first ratio constant and corresponds to a ratio of said first portion of said first generated signal to said first portion of said second generated signal, and r_v is a second ratio constant and corresponds to a ratio of said second portion of said first generated signal to said second portion of said second generated signal.	p. 15, ll. 29 - 36; p. 16, l. 25 - p. 17, l. 6; p. 98, l. 22- p. 99, l. 2; p. 99, l. 24 - p. 100, ll. 1-4.
30. The method of Claim 22 wherein said mathematical relationship has the following form: $$s_2 = (S_{red} - r_v S_{IR})/(r_a - r_v)$$ where s_2 corresponds to said first portion of said second generated signal, S_{red} corresponds to said first generated signal, including said first and second portions of said first generated signal, S_{IR} corresponds to said second generated signal, including said first and second portions of said second generated signal, r_a is said first ratio constant and corresponds to a ratio of said first portion of said first generated signal to said first portion of said second generated signal, and r_v is a second ratio constant and corresponds to a ratio of said second portion of said first	p. 15, ll. 29 - 36; p. 16, l. 25 - p. 17, l. 6; p. 98, l. 22- p. 99, l. 2; p. 99, l. 24 - p. 100, ll. 1-4.

TERMS OF THE CLAIMS	APPLICATION TO THE DISCLOSURE
generated signal to said second portion of said second generated signal.	

6.   Timing of Request - 37 C.F.R. §1.607(a)(6)

37 C.F.R. §1.607(a)(6) is irrelevant because this request and the accompanying 37 C.F.R. §1.607(a)(4) amendment are being submitted prior to one year from the date on which the '105 patent was granted.

7.   Examination Conducted with Special Dispatch - 37 C.F.R. §1.607(b)

Under 37 C.F.R. §1.607(b), Applicants respectfully request that the examination of the present application be conducted with special dispatch.

8.   Identification of Presented Claims Corresponding Substantially to Patent Claims - 37 C.F.R. §1.607(c)

Claim 15 of the application corresponds substantially to Claim 1 of the '105 patent. Claims 16-18 of the application correspond substantially to Claims 3-5 of the '105 patent. Claims 19-24 of the application correspond substantially to Claims 7-12 of the '105 patent. Claims 25-26 of the application correspond substantially to Claims 14-15 of the '105 patent. Claims 27-30 of the application correspond substantially to Claims 17-20 of the '105 patent.

9.   Request for Benefit of Filing Date of Applicants' Priority Applications

Applicants claim priority under 35 U.S.C. § 120 to earlier filed applications as follows. The present application is a continuation of U.S. Patent Application Serial No. 08/859,837, filed May 16, 1997 to Mohamed K. Diab, et al. entitled SIGNAL PROCESSING APPARATUS, which is a continuation of Application Serial No. 08/320,154 (now Issued Patent No. 5,632,272) filed October 7, 1994, which is a continuation-in-part application from Application Serial No. 08/132,812 (now U.S. Patent No. 5,490,505) filed October 6, 1993. Applicants are entitled to the benefit of the filing dates of these earlier filed applications for interference purposes on Counts 1 and 2, as Counts 1 and 2 each read on at least one adequately disclosed embodiment in such applications. Weil v. Fritz, 572 F.2d 856, 865-66, n. 16 (C.C.P.A. 1978).

The written description of the present application is identical to that of Application Serial No. 08/320,154 filed on October 7, 1994. The application of the terms of the presented claims to the disclosure herein is therefore equally applicable to the disclosure of Application Serial No. 08/320,154. Furthermore, for purposes of Counts 1 and 2, the disclosure of Application Serial No.

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08/132,812, filed October 6, 1993 provides substantially the same support as the present application. An additional table providing support from Application Serial No. 08/132,812 is provided as Appendix B.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: _Sept. 1, 1998_   By: _Stephen C. Jensen_

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APPENDIX A

<u>Count 1</u>:

A system for the enhancement of physiological signals for the measurement of blood oxygen in a subject, the system comprising:

first and second light sources to direct light toward the subject, said first and second light sources producing first and second light signals of first and second wavelengths, respectively;

a light detector positioned to detect said first and second light signals after interaction with the subject and to generate first and second signals indicative of an intensity of said first and second detected light signals, respectively, said first generated signal having a first portion arising from light transmitted from said first source and a second portion arising from a first interference source; said second generated signal having a first portion arising from light transmitted from said second source and a second portion arising from a second interference source;

an adaptive signal processor having a signal input coupled to said light detector to receive said first generated signal, an adaptive filter having an input to receive a reference signal, and an output, and an error output to generate an error signal, wherein said error output is coupled to said adaptive filter to adjust said adaptive filter so that a function of said error signal has a minimum;

wherein said first and second portions of said first and second generated signals and a first ratio constant have a defined mathematical relationship;

a reference signal generator to generate said reference signal based on a possible value of said first ratio constant; and

a peak detector to receive an output signal from said adaptive signal processor and determine a calculated value for said first ratio constant corresponding to a first peak value of said output signal over a predetermined range of possible ratios, said reference signal generator generating said first portion of said first detected signal and said first portion of said second detected signal based on said mathematical relationship and said calculated value of said first ratio constant.

<u>Count 2</u>:

A system for the enhancement of physiological signals for the measurement of blood oxygen in a subject, the system comprising:

first and second light sources to direct light toward the subject, said first and second light sources producing first and second light signals of first and second wavelengths, respectively;

a light detector positioned to detect said first and second light signals after interaction with the subject and to generate first and second signals indicative of an intensity of said first and second detected light signals, respectively, said first generated signal having a first portion arising from light transmitted from said first source and a second portion arising from a first interference source; said second generated signal having a first portion arising from light transmitted from said second source and a second portion arising from a second interference source;

an adaptive signal processor having a signal input coupled to said light detector to receive said first generated signal, an adaptive filter having an input to receive a reference signal, and an output, and an error output to generate an error signal, wherein said error output is coupled to said adaptive filter to adjust said adaptive filter so that a function of said error signal has a minimum;

wherein said first and second portions of said first and second generated signals and a first ratio constant have a mathematical relationship derived from the following model:

$$S_{red} = s_1 + n_1$$
$$S_{IR} = s_2 + n_2$$
$$s_1 = r_a s_2$$
$$n_1 = r_v n_2$$

where S_{red} corresponds to said first generated signal, s_1 corresponds to said first portion of said first generated signal, n_1 corresponds to said second portion of said first generated signal, S_{IR} corresponds to said second generated signal, s_2 corresponds to said first portion of said second generated signal, n_2 corresponds to said second portion of said second generated signal, r_a is said first ratio constant and corresponds to a ratio of said first portion

of said first generated signal to said first portion of said second generated signal, and r_v is a second ratio constant and corresponds to a ratio of said second portion of said first generated signal to said second portion of said second generated signal;

a reference signal generator to generate said reference signal based on a possible value of said first ratio constant; and

a peak detector to receive an output signal from said adaptive signal processor and determine a calculated value for said first ratio constant corresponding to a first peak value of said output signal over a predetermined range of possible ratios, said reference signal generator generating said first portion of said first detected signal and said first portion of said second detected signal based on said mathematical relationship and said calculated value of said first ratio constant.

APPENDIX B

TERMS OF THE CLAIMS	APPLICATION TO THE PRIORITY DISCLOSURE 08/132,812
15. A system for the enhancement of physiological signals for the measurement of blood oxygen in a subject,	p. 7, ll. 27-31; p. 8, l. 18 - p. 9, l. 8; p. 78, ll. 1-20.
the system comprising:	
first and second light sources to direct light toward the subject, said first and second light sources producing first and second light signals of first and second wavelengths, respectively;	p. 9, ll. 28-31; p. 79, ll. 5-14, ll. 32-34; p. 81, ll. 3-5.
a light detector positioned to detect said first and second light signals after interaction with the subject and to generate first and second signals indicative of an intensity of said first and second detected light signals, respectively, said first generated signal having a first portion arising from light transmitted from said first source and a second portion arising from a first interference source; said second generated signal having a first portion arising from light transmitted from said second source and a second portion arising from a second interference source;	p. 9, ll. 7 - p. 10, l. 7; p. 28, l. 25 - p. 29, l. 12; Figures 4a-4b; p. 80, ll. 1-12; p. 81, ll. 5-7; p. 82, l. 19 - p. 83, l. 2; p. 93, l. 23 - p. 94, l. 23; Figures 26, 27.
an adaptive signal processor having a signal input coupled to said light detector to receive said first generated signal, an adaptive filter having an input to receive a reference signal, and an output, and an error output to generate an error signal, wherein said error output is coupled to said adaptive filter to adjust said adaptive filter so that a function of said error signal has a minimum,	p. 27, l. 30 - p. 28, l. 9; p. 28, ll. 22-25; Figures 4a - b; p. 30, l. 5 - p. 32, l. 10; Figures 5a - b; p. 53, ll. 6-30; p. 80, ll. 4-31; p. 81, l. 25 - p. 82, l. 17; Figure 11.
wherein said first and second portions of said first and second generated signals and a first ratio constant have a defined mathematical relationship;	p. 29, ll. 12-33; Figures 4a, 4b; p. 34, l. 22 - p. 35, l. 8, and, in particular, Equations 5a, 5b; p. 107, ll. 14-22.
a reference signal generator to generate said reference signal based on a possible value of said first ratio constant; and	p. 29, l. 12 - p. 30, l. 3; p. 52, l. 9 - p. 53, l. 6; p. 107, ll. 14-22.

TERMS OF THE CLAIMS	APPLICATION TO THE PRIORITY DISCLOSURE 08/132,812
a peak detector to receive an output signal from said adaptive signal processor and determine a calculated value for said first ratio constant corresponding to a first peak value of said output signal over a predetermined range of possible ratios, said reference signal generator generating said first portion of said first detected signal and said first portion of said second detected signal based on said mathematical relationship and said calculated value of said first ratio constant.	p. 33, l. 32 - p. 35, l. 8, and in particular Equation 5b; p. 52, l. 9 – p. 53, l. 30; Figures 7a-c.
16. The system of Claim 15 wherein said output signal received by said peak detector is selected from a set of output signals comprising approximations to said first and second signal portions of said first and second signals, wherein said error signal output and said adaptive filter output generate output signals of said set.	p. 31, l. 21 - p. 32, l. 10; Figure 5a-b.
17. The system of Claim 15, further including an oxygen saturation calculating circuit to determine blood oxygen saturation of the subject based on said calculated value of said first ratio constant.	p. 71, l. 25 - p. 72, l. 3; p. 82, ll. 11-17; Figure 11; p. 88, ll. 9-29, and in particular Equations 102, 103a; p. 100, l. 10 - p. 102, l. 18, and in particular Equations 107a, 108a; p. 104, ll. 6-33.
19. The system of Claim 15 wherein said first and second wavelengths are in the red and infrared wavelength range, respectively.	p. 33, ll. 8-23; p. 57, l. 16; p. 79, ll. 33-35; p. 88, ll. 9-12; p. 100, ll. 27-30.
20. The system of Claim 15 wherein said mathematical relationship has the following form: $s_2 = (S_{red}-r_vS_{1R})/(r_a-r_v)$ and $s_1 = r_as_2$ where s_1 corresponds to said first portion of said first generated signal, S_{red} corresponds to said first generated signal, including said first and second portions of said first generated signal, S_{1R} corresponds to said second generated signal, including said first and second portions of said second generated signal, r_a is said first ratio constant and corresponds to a ratio of said first portion of said first generated signal to said first portion of said second	p. 27, ll. 3 – p. 35, l. 9.

TERMS OF THE CLAIMS	APPLICATION TO THE PRIORITY DISCLOSURE 08/132,812
generated signal, and r_v is a second ratio constant and corresponds to a ratio of said second portion of said first generated signal to said second portion of said second generated signal.	
21. The system of Claim 15 wherein said mathematical relationship has the following form: $$s_2 = (S_{red} - r_v S_{IR})/(r_a - r_v)$$ where s_2 corresponds to said first portion of said second generated signal, S_{red} corresponds to said first generated signal, including said first and second portions of said first generated signal, S_{IR} corresponds to said second generated signal, including said first and second portions of said second generated signal, r_a is said first ratio constant and corresponds to a ratio of said first portion of said first generated signal to said first portion of said second generated signal, and r_v is a second ratio constant and corresponds to a ratio of said second portion of said first generated signal to said second portion of said second generated signal.	p. 27, ll. 3 - p. 9
22. A method for the enhancement of physiological signals for the measurement of blood oxygen in a subject,	p. 7, ll. 27-31; p. 8, l. 18 - p. 9, l. 8; p. 78, ll. 1-20.
the method comprising the steps of:	
directing light from first and second light sources of different wavelengths toward the subject;	p. 9, ll. 28-31; p. 79, ll. 5-14, ll. 32-34; p. 81, ll. 3-5.
detecting signals from said first and second light sources after interaction with the subject and generating first and second signals corresponding to an intensity of said first and second detected signals, respectively, said first generated signal having a first portion arising from light transmitted from said first source and a second portion arising from a first interference source, said second generated signal having a first portion arising from light transmitted from said second source and a second portion	p. 9, ll. 7 - p. 10, l. 7; p. 28, l. 25 - p. 29, l. 12; Figures 4a-4b; p. 80, ll. 1-12; p. 81, ll. 5-7; p. 82, l. 19 - p. 83, l. 2; p. 93, l. 23 - p. 94, l. 23; Figures 26, 27.

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arising from a second interference source;	
coupling said first generated signal to a signal input of an adaptive signal processor having an adaptive filter having an input to receive a reference signal, and an output, and an error output generating an error signal wherein said error signal is coupled to said adaptive filter to adjust said adaptive filter so that a function of said error signal has a minimum;	p. 27, l. 30 - p. 28, l. 9; p. 28, ll. 22-25; Figures 4a - b; p. 30, l. 5 - p. 32, l. 10; Figures 5a - b; p. 53, ll. 6-30; p. 80, ll. 4-31; p. 81, l. 25 - p. 82, l. 17; Figure 11.
Coupling an output signal from said adaptive signal processor to a peak detector and calculating a first ratio value corresponding to a first detected peak value of said error signal over a predetermined range of possible ratio values;	p. 52, l. 9 - p. 53, l. 30; Figures 7a-c.
Generating a first reference signal based on a mathematical relationship of said first and second portions of said first and second generated signals, and said first ratio value; and	p. 29, ll. 12 - p. 30, l. 3; Figures 4a, 4b; p. 34, l. 22 - p. 35, l. 8, and, in particular, Equations 5a, 5b; p. 107, ll. 14-22.
Coupling said first reference signal to said adaptive filter input wherein said filter output generates an estimate of said first portion of said first generated signal.	p. 31, ll. 21-30; Figure 5b; p. 33, l. 8 - p. 35, l. 8.
23. The method of Claim 22 wherein said output signal from said adaptive signal processor is said error signal and said calculated first ratio value is based on said first detected peak value in said error signal.	p. 31, l. 21 - p. 32, l. 10; Figures 5a-b; p. 53, ll. 6 - 30; Figures 7a-c.
24. The method of Claim 22 wherein said output signal from said adaptive signal processor is derived from said adaptive filter output and said calculated first ratio value is based on said first detected peak value in said output signal derived from adaptive filter output.	p. 31, l. 21 - p. 32, l. 10; Figures 5a-b; p. 53, ll. 6 - 30; Figures 7a-c.
25. The method of Claim 24, further including the step of generating an approximation to said first portion of said second generated signal based on said mathematical relationship and said calculated first ratio value.	p. 31, l. 21 - p. 32, l. 10; Figure 5a; p. 33, l. 8 - p. 35, l. 9.

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26. The method of Claim 25 wherein said first ratio value is a ratio of said first portion of said first generated signal to said first portion of said second generated signal.	p. 33, l. 8 - p. 35, l. 9, and in particular Equation 3; p. 107, ll. 14-22.
27. The method of Claim 22, further including the step of determining a blood oxygen saturation level of the subject based on said calculated first ratio value.	p. 71, l. 25 - p. 72, l. 7; p. 88, ll. 9-29, and in particular Equations 102, 103a; p. 100, l. 10 - p. 102, l. 18, and in particular Equations 107a, 108a; p. 104, ll. 6-33.
29. The method of Claim 22 wherein said mathematical relationship has the following form: $$s_2 = (S_{red}-r_v S_{IR})/(r_a-r_v) \text{ and } s = r_a s_2$$ where s_2 corresponds to said first portion of said first generated signal, S_{red} corresponds to said first generated signal, including said first and second portions of said first generated signal, S_{IR} corresponds to said second generated signal, including said first and second portions of said second generated signal, r_a is said first ratio constant and corresponds to a ratio of said first portion of said first generated signal to said first portion of said second generated signal, and r_v is a second ratio constant and corresponds to a ratio of said second portion of said first generated signal to said second portion of said second generated signal.	p. 27, ll. 3 - p. 35, l. 9.

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30. The method of Claim 22 wherein said mathematical relationship has the following form: $$s_2 = (S_{red} - r_v S_{IR})/(r_a - r_v)$$ where s_2 corresponds to said first portion of said second generated signal, S_{red} corresponds to said first generated signal, including said first and second portions of said first generated signal, S_{IR} corresponds to said second generated signal, including said first and second portions of said second generated signal, r_a is said first ratio constant and corresponds to a ratio of said first portion of said first generated signal to said first portion of said second generated signal, and r_v is a second ratio constant and corresponds to a ratio of said second portion of said first generated signal to said second portion of said second generated signal.	p. 27, ll. 3 - p. 35, l. 9.

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